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EVALUATION OF LUNG GLUCOSE UPTAKE WITH FLUORINE-18 FLUORODEOXYGLUCOSE POSITRON EMISSION TOMOGRAPHY/CT IN PATIENTS WITH PULMONARY ARTERY HYPERTENSION AND PULMONARY HYPERTENSION DUE TO LEFT HEART DISEASE

Poster Contributions
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Background: Pulmonary arterial hypertension (PAH) is characterized by remodeling of the media with proliferation of smooth muscle cells in pulmonary arteries and arterioles. In contrast, pulmonary hypertension (PH) associated with left heart disease (group 2 PH) is caused by passive transmission of elevated pulmonary venous pressure +/- a reactive component. Studies showed increased glucose uptake in lung parenchyma in animal models or small PAH patient cohorts, and may reflect metabolic abnormalities in remodeled pulmonary vasculature. However, no study has compared lung FDG uptake in patients with PAH vs those with group 2 PH.

Methods: Twenty-two patients with PAH (13 patients with idiopathic PAH and 9 patients with connective tissue disease), 8 patients with group 2 PH, and 14 control subjects (no lung disease, no uncontrolled diabetes or PH) were included. All PH patients underwent right heart catheterization and FDG-PET/CT imaging. Regions of interest (ROIs) were drawn to include the lateral one-third of the lungs on the sagittal images to avoid including pulmonary vessels or non-specific fibrosis. The mean standard uptake value (SUV g/mL) of FDG in each lung was obtained and average values of both lungs were calculated as mean lung FDG SUV. The correlation between hemodynamics and mean lung FDG SUV was also analyzed in PH patients.

Results: There was no significant difference in the mean age between cohorts (PAH 55.6±14.0 vs group 2 PH 59.4±14.5 vs control 55.9±17.1 yrs, p=0.83). Eighteen of the 22 patients with PAH were treated with PAH-specific drugs. Mean pulmonary arterial pressure (mPAP) was not significantly different between PAH and group 2 PH (45.0±12.1 vs 42.1 mmHg, p=0.56), but mean PCWP was lower with PAH than group 2 PH (8.4±3.5 vs 29.6 ±7.0 mmHg, p <0.0001). PAH patients demonstrated significantly increased mean lung FDG SUV compared with group 2 PH and control (PAH: 0.79±0.27 vs group 2 PH: 0.51±0.12 vs control: 0.53±0.16, p=0.001). The mean lung FDG SUV did not correlate with mPAP either in PAH or group 2 PH.

Conclusion: PAH is associated with increased lung FDG uptake indicating increased glucose metabolism in the lung. This may represent active inflammation and requires further study.